

### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

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1. (currently amended) An apparatus for spraying liquid surface treatment material, said apparatus comprising:
- a housing;
  - a liquid inlet for supply of the liquid surface treatment material;
  - a gas inlet for supply of pressurised gas to be mixed with the liquid surface treatment material;
  - an outlet nozzle through which the gas and liquid surface treatment material is sprayed;
  - a control valve adapted to regulate the supply of the liquid surface treatment material to the outlet nozzle;
  - a gas valve operable between an open position and a closed position;
  - a first communicating passageway connecting said gas inlet to said gas valve; and
  - a second communicating passageway connecting said gas valve to said outlet nozzle;
- wherein said second passageway is provided with a stepped portion therein which projects into the second passageway so that a gas vortex is created therethrough.
2. (original) An apparatus according to Claim 1, wherein said second passageway is offset from said first passageway.
3. (previously presented) An apparatus according to Claim 1, wherein said second passageway is substantially conical in shape.
4. (previously presented) An apparatus according to Claim 1, wherein said second passageway includes an inlet and an outlet, wherein said second passageway is tapered from said inlet to said outlet.
5. (currently amended) ~~An apparatus according to Claim 4, wherein said taper is between 1 to 15°~~ for spraying liquid surface treatment material, said apparatus comprising:
- a housing;
  - a liquid inlet for supply of the liquid surface treatment material;
  - a gas inlet for supply of pressurised gas to be mixed with the liquid surface treatment

material;

an outlet nozzle through which the gas and liquid surface treatment material is sprayed;

a control valve adapted to regulate the supply of the liquid surface treatment material to the outlet nozzle;

a gas valve operable between an open position and a closed position;

a first communicating passageway connecting said gas inlet to said gas valve;

a second communicating passageway connecting said gas valve to said outlet nozzle;

wherein said second passageway is provided with a stepped portion therein so that a gas vortex is created therethrough, and wherein said second passageway includes an inlet and an outlet, said second passageway being tapered from said inlet to said outlet between 1 to 15°.

6. (currently amended) An apparatus according to ~~Claim 4~~, wherein said ~~second passageway~~ has a radius of curvature at said outlet so as to provide gas to the outlet nozzle in a substantially horizontal direction for spraying liquid surface treatment material, said apparatus comprising:

a housing;

a liquid inlet for supply of the liquid surface treatment material;

a gas inlet for supply of pressurised gas to be mixed with the liquid surface treatment material;

an outlet nozzle through which the gas and liquid surface treatment material is sprayed;

a control valve adapted to regulate the supply of the liquid surface treatment material to the outlet nozzle;

a gas valve operable between an open position and a closed position;

a first communicating passageway connecting said gas inlet to said gas valve;

a second communicating passageway connecting said gas valve to said outlet nozzle;

wherein said second passageway is provided with a stepped portion therein so that a gas vortex is created therethrough, and wherein said second passageway includes an inlet and an outlet, wherein said second passageway is tapered from said inlet to said outlet and has a radius of curvature at said outlet so as to provide gas to the outlet nozzle in a substantially horizontal direction.

7. (currently amended) An apparatus according to ~~Claim 1~~, wherein said ~~stepped portion of said second passageway~~ comprises a ledge whose width tapers up to a maximum of 10% of the radius of said second passageway at the level of the stepped portion for spraying liquid surface treatment material, said apparatus comprising:

a housing;  
a liquid inlet for supply of the liquid surface treatment material;  
a gas inlet for supply of pressurised gas to be mixed with the liquid surface treatment material;  
an outlet nozzle through which the gas and liquid surface treatment material is sprayed;  
a control valve adapted to regulate the supply of the liquid surface treatment material to the outlet nozzle;  
a gas valve operable between an open position and a closed position;  
a first communicating passageway connecting said gas inlet to said gas valve;  
a second communicating passageway connecting said gas valve to said outlet nozzle;  
wherein said second passageway is provided with a stepped portion therein so that a gas vortex is created therethrough, said stepped portion of said second passageway comprising a ledge whose width tapers up to a maximum of 10% of the radius of said second passageway at the level of the stepped portion.

8. (original) An apparatus according to Claim 7, wherein the longitudinal axis of said outlet nozzle extends across said second passageway.

9. (original) An apparatus according to Claim 8, wherein the axis of symmetry of said ledge is offset from said longitudinal axis of said outlet nozzle.

10. (original) An apparatus for spraying liquid surface treatment material, said apparatus comprising:

a housing;  
a liquid inlet for supply of the liquid surface treatment material;  
a gas inlet for supply of pressurised gas to be mixed with the liquid surface treatment material;  
an outlet nozzle through which the gas and liquid surface treatment material is sprayed;  
a control valve adapted to regulate the supply of the liquid surface treatment material to the outlet nozzle;  
a gas valve operable between an open position and a closed position;  
a first communicating passageway connecting said gas inlet to said gas valve; and  
a second communicating passageway connecting said gas valve to said outlet nozzle;  
wherein said second passageway is axially offset from said first passageway and is substantially conical in shape, and wherein said second passageway includes an inlet and an

outlet and outwardly tapers from said inlet to said outlet at an angle of taper of between 1 and 15°.

11. (currently amended) An apparatus according to Claim 10 ~~any preceding claim~~, further comprising a trigger means;  
whereby said trigger means is adapted to operate both of said control valve and said gas valve.

12. (original) An apparatus according to Claim 11, wherein said control valve is a liquid control needle valve.

13. (original) An apparatus according to Claim 12, wherein said gas valve is an axially-sliding piston valve.

14. (original) An apparatus according to Claim 13, wherein said outlet nozzle is controlled by said liquid control needle valve.

15. (previously presented) An apparatus according to Claim 13, wherein said piston valve produces an annular air jet in said second passageway.

16. (previously presented) An apparatus according to Claim 13, further comprising an air control valve stem which is connected to said piston valve and operated by said trigger means.

17. (currently amended) An apparatus according to Claim 13, ~~supplied with a liquid by said gravity liquid reservoir~~ wherein said piston valve comprises an inner apertured sleeve and an outer apertured sleeve, said inner and outer sleeves being co-axial, and wherein said inner sleeve is located within said outer sleeve and is rotatably adjustable relative to said outer sleeve.

18. (previously presented) An apparatus according to Claim 12, wherein the liquid control needle valve is controlled by said trigger means via an axially-sliding sleeve or slipper member situated on a rearward portion of said housing.

19. (previously presented) An apparatus according to Claim 12, wherein said liquid control needle valve is provided with a rotational flow adjustment means.

20. (original) An apparatus according to Claim 19, wherein said flow adjustment means comprises a stem member, a rotational adjuster, and a return spring, said stem member being threaded at its rearmost extremity to accept said rotational adjuster.
21. (original) An apparatus according to Claim 20, wherein said stem member is actuated externally by said trigger means, and is returned to its initial position by said return spring.
22. (previously presented) An apparatus according to Claim 12, wherein said liquid inlet comprises a pressurized material supply connector, and wherein said needle valve is supplied with a liquid by said pressurized material supply connector.
23. (previously presented) An apparatus according to Claim 12, wherein said liquid inlet comprises a gravity feed liquid reservoir, and wherein said needle valve is supplied with a liquid by said gravity liquid reservoir.
24. (previously presented) An apparatus according to Claim 10, further comprising a regulating valve and a pair of side jets, whereby the spray pattern of the outlet nozzle is regulated by said regulating valve, and said side jets are utilised to regulate said spray pattern.
25. (original) A method of spraying a liquid onto a surface, said method comprising the steps of:
- supplying a liquid to be sprayed into a liquid inlet of a spray apparatus;
  - supplying a pressurised gaseous propellant into a gas inlet of said spray apparatus;
  - passing said gaseous propellant through a communicating passageway from said gas inlet to an outlet nozzle;
  - accelerating said gaseous propellant by creating a gas vortex as said propellant passes through said communicating passageway;
  - passing said accelerated propellant through an outwardly tapering portion of the communicating passageway to further accelerate the vortex and supply the propellant to the outlet nozzle in the form of an annular gas jet, the portion tapering outwardly in the direction of propellant flow; and
  - spraying said liquid onto a surface by mixing said liquid and said annular gas jet at said nozzle.
26. (original) A method according to Claim 25, wherein said passageway comprises an

upper portion and a lower portion, wherein said upper portion is axially offset from said lower portion and is substantially conical in shape.

27. (currently amended) A method according to Claim 26, wherein said upper portion of said passageway includes an inlet and an outlet and is tapered from said inlet to said outlet at an angle of taper of between 1 and 15°.

28. (previously presented) A method according to Claim 25, wherein the mixing of said liquid and said annular gas jet is controlled by a trigger valve mechanism on said spray apparatus.

29. (original) A method according to Claim 28, wherein said trigger valve mechanism comprises:

- a gas valve operable between an open position and a closed position;
  - a control valve adapted to regulate the supply of the liquid to be sprayed; and
  - a trigger means;
- whereby said trigger means is adapted to operate both of said gas and control valves.

30. (original) A method according to Claim 29, wherein said control valve is a liquid control needle valve.

31. (original) A method according to Claim 30, wherein said gas valve is an axially-sliding piston valve.

32. (original) A method according to Claim 31, wherein said piston valve comprises an inner apertured sleeve and an outer apertured sleeve, said inner and outer sleeves being co-axial, and wherein said inner sleeve is located within said outer sleeve and is rotatably adjustable relative to said outer sleeve.

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